Missouri State Milk Board Informational Guide for Construction and Reconstruction of Milk Facilities

Regulatory Requirements (source)

Recommendations and Information

Plans

- Properly prepared plans for all milk houses, milking barns, stables and parlors, milk tank truck cleaning facilities, milk plants, receiving stations, and transfer stations regulated under this *Ordinance* which are hereafter constructed, reconstructed or extensively altered shall be submitted to the Regulatory Agency for written approval before work is begun. **(Pasteurized Milk Ordinance (PMO) Section 12)**

- Detailed plans for CIP cleaned pipeline systems are submitted to the Regulatory Agency for written approval prior to installation. No alteration or addition shall be made to any milk pipeline system without prior written approval of the Regulatory Agency. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

    - *State Milk Board (SMB) Policy number five requires the following minimum information on the barn plan: 1. Bulk Tank 2. Wash Vat 3. Hand Sink 4. Hauler Slab 5. Hose Port 6. Water Heater 7. Receiver Jar 8. Swing line 9. Pipeline 10. Drains 11. Lights 12. Windows 13. Ventilation 14. Doors with direction of opening 15. Flush System Design.*

    - While there has been a tendency for workers to develop strong convictions about the practicability of given housing or milking systems, there is little doubt that the success or failure of most dairy farm operations may be traced to good or poor planning. When the unique problems of each system in its individual applications are given proper consideration, the job of producing clean milk is made easier and compliance with regulations is simplified. **(Pasteurized Milk Ordinance (PMO) Appendix C)**

Location

- Many factors need to be considered when selecting a location for a new dairy facility: **(State Milk Board (SMB))**
    - A well-maintained road is needed to ensure the milk hauler can get to your barn and you can sell you milk.
    - Access to electricity and water.
    - Disposal of human and animal waste.

- Adequate drainage.
- In order to keep the hauler slab clean livestock and domestic foul need to be kept away from the loading area.

- Acceptable site locations are to be discussed/received with field representatives and the regulatory agency prior to construction.

Water Supply

- The water supply for milk house and milking operations is approved as safe by the State water control authority and, in the case of individual water systems, complies with the specifications outlined in Pasteurized Milk Board (PMO) Appendix D, and the bacteriological standards outlined in Pasteurized Milk Ordinance (PMO) Appendix G. **(Pasteurized Milk Ordinance (PMO) Item 8r)**

- The Missouri Department of Natural Resources, Division of Geology and Land Survey regulates the drilling of well and the reconstruction of wells. (573) 368-2165. **(State Milk Board (SMB))**

    - Water supply is to be 100ft from a source of contamination, 300ft from end-storage.

Sewage Systems and Toilets

- There is at least one flush toilet connected to a public sewer system or to an individual sewage-disposal system or a chemical toilet, earth pit privy or other type of privy. Such sewage systems shall be and operated in accordance with the standards outlined in Pasteurized Milk Ordinance (PMO) Appendix C, or when a Regulatory Agency has more effective standards designed specifically for that region, these standards may apply, provided, that there is no mixing of animal and human waste. **(Pasteurized Milk Ordinance (PMO) Item 7r)**

- There are other laws that affect the disposal of human waste, including those promulgated by local health or building code agencies, the Missouri Department of Health (DHSS) (RSMo 701) and the Missouri Department of Natural Resources (DNR) (RSMo 644). Before constructing new or remodeling existing waste disposal systems contact both your local health department and your dairy sanitarian **(State Milk Board (SMB))**

- A toilet or privy is convenient to the milking barn and the milk house**.** There shall be no evidence of human defecations or urination about the premises. **(Pasteurized Milk Ordinance (PMO) Item 7r)**

- No privy opens directly into the milk room. **(Pasteurized Milk Ordinance (PMO) Item 7r)**

- The toilet room, including all fixtures and facilities, is kept clean and free of insects and odors. **(Pasteurized Milk Ordinance (PMO) Item 7r)**

- Where flush toilets are used, doors to toilet rooms are tight and self-closing. All outer openings in toilet rooms shall be screened or otherwise protected against the entrance of insects**. (Pasteurized Milk Ordinance (PMO) Item 7r)**

Milk House

General

- A separate milk house of sufficient size is provided for the cooling, handling and storing of milk and the washing, sanitizing and storing of milk containers and utensils. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    - The following distances around the bulk milk tank are recommended **(State Milk Board (SMB))**:
        1. Working side: 36 inches from wall or other equipment.
        2. Outlet valve: 36 inches from wall or other equipment.
        3. Non-working: 24 inches from wall or other equipment.
        4. Rear-end (opposite of valve): 24 inches from wall or other equipment.
        5. For CIP tanks three and four above may be reduced to 18 inches.
        6. Tanks maybe bulk headed with proper protection.
        7. The rear of nearly flat-ended bulk tanks may be butted to the wall, if sealed to the wall like a bulk headed tank.

- The milk house is used for no other purpose than milk house operations. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- A vestibule, if used, complies with the applicable milk house construction requirements. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- There is no direct opening into any barn, stable or room used for domestic purposes. Except that an opening between the milk house and milking barn, stable, or parlor is permitted when a tight-fitting, self-closing, solid door(s) hinged to be single or double acting is provided. Except that screened vents are permitted in the wall between the milk house and a breezeway, which separates the milk house from the milking parlor, provided animals are not housed within the milking facility. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

Floors and Drains

- The floors of all milk houses are constructed of good quality concrete (float finish permissible), or equally impervious tile, or brick laid closely with impervious material, or metal surfacing with impervious joints or other material the equivalent of concrete and maintained free of breaks, depressions, and surface peelings. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- The floor slopes to drain so that there are no pools of standing water. The joints between the floor and the walls shall be watertight. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- The liquid wastes are disposed of in a sanitary manner. All floor drains are accessible and are trapped if connected to a sanitary sewer. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    - Floor drains should not be located under bulk milk tanks unless there is sufficient room for servicing. Floor drains should not be located directly under the outlet of a bulk milk tank. Drains and waste disposal systems should be adequate to drain the volume of water used in rinsing and cleaning. **(Pasteurized Milk Ordinance (PMO) Appendix C)**

Walls and Ceilings

- Walls and ceilings are constructed of smooth dressed lumber or similar material, well painted with a light-colored washable paint; and are in good repair. Surfaces and joints shall be tight and smooth. Sheet metal, tile, cement block, brick, concrete, cement plaster or similar materials of light color may be used and the surfaces and joints shall be smooth. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    - When window sills are sloped or windows set flush with interior walls the accumulation of dust and unwanted miscellaneous items is greatly lessened. **(State Milk Board (SMB))**
    - Stem walls of block or poured cement eight inches high are encouraged when wooden frame wall construction is used to prevent the rotting of the wooden wall members. **(State Milk Board (SMB))**

- Milk houses are effectively screened or otherwise protected against the entrance of vermin. **(Pasteurized Milk Ordinance (PMO) Item 19r)**

- Outer milk house doors are tight and self-closing. Screen doors shall open outward. **(Pasteurized Milk Ordinance (PMO) Item 19r)**

Lighting and Ventilation

- A minimum of 20 foot-candles (220 lux) of light is provided at all working areas from natural and/or artificial light for milk house operations. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- The milk house is adequately ventilated to minimize condensation on floors, walls, ceilings and clean utensils. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    - Milk rooms should be well ventilated. Proper ventilation not only avoids the obvious disadvantages of condensation on equipment and walls; it also lengthens the useful life of the building and its equipment. The constant need for renewal of painted surfaces, the repair of wooden fixtures and frames and the removal of algae and mold from walls and ceilings of poorly ventilated milk rooms can represent a continuing expense to the operator. **(Pasteurized Milk Ordinance (PMO) Appendix C)**

    - Forced air ventilation of the milk house on new construction and on existing facilities being brought back into use is recommended. **(State Milk Board (SMB))**

- Vents, if installed, and lighting fixtures are installed in a manner to preclude the contamination of bulk milk tanks or clean utensil storage areas. **(Pasteurized Milk Ordinance (PMO0 Item 5r)**

- Lights shall not be directly over bulk tank openings. **(Pasteurized Milk Ordinance (PMO) interpretation)**

    - On new construction there should be no light fixtures installed directly over the wash vat. **(State Milk Board (SMB))**

Hose Port and Hauler's Slab

- The transfer of milk from a bulk milk tank to a bulk milk pickup tanker is through a hose port located in the milk house wall. The port shall be fitted with a tight door, which shall be in good repair. It shall be kept closed except when the port is in use. An easily cleanable surface shall be constructed under the hose port, adjacent to the outside wall and sufficiently large to protect the milk hose from contamination.
  Provided, milk can be transferred from a bulk milk tank to a bulk milk pickup tanker by stubbing the milk transfer and associated CIP cleaned lines outside the milk house wall, provided:
    a. A concrete slab of adequate size, to protect the transfer hose, shall be provided under the stubbed sanitary milk and CIP cleaned lines.
    b. The outside wall of the milk house, where the sanitary piping and concrete slab are located shall be properly maintained and kept in good repair.

c. The sanitary piping, stubbed outside the milk house, shall be properly sloped to assure complete drainage and the ends of the piping, which are located outside, shall be capped when the transfer hose is disconnected.
d. After the completion of milk transfer, the milk lines and transfer hose shall be properly CIP cleaned.
e. After the CIP cleaning process has been completed; the transfer hose shall be disconnected, drained and stored in the milk house. Proper storage of the transfer hose includes capping the ends and storing the entire hose up off the floor. The sanitary piping outside the milk house shall be capped at all times, except when transferring milk or being CIP cleaned. When the caps are not being used, they shall be properly cleaned and sanitized after each use and stored in the milk house to protect them from contamination. A transfer hose manufactured with permanent hose end fittings, attached in such a manner that will assure a crevice-free joint between the hose and the fitting, may be stored outside of the milk house, provided it is CIP cleaned; the stubbed piping and hose length are of sufficient design to allow complete drainage after cleaning and sanitizing; and the hose remains connected to the stubbed piping when not in use.
f. Means shall be provided to sanitize the milk-contact surfaces of the transfer hose and bulk milk pickup tanker fittings prior to the connection of the transfer hose to the bulk milk pickup tanker.
g. At all times, the bulk milk pickup tanker manhole openings(s) shall remain closed, except for brief periods for sampling and examination when environmental conditions permit. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

h. A cement slab with a minimum size of 32 square feet that extends two feet past the hose port is recommended. **(State Milk Board (SMB))**

- Dairies are allowed to direct loading to the Construction Guidelines in accordance with the Pasteurized Milk Ordinance (PMO) guidelines and guidelines from the surrounding states.

Cleaning Facilities

- Water under pressure is piped into the milk house. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- Each milk house is provided with facilities for heating water in sufficient quantity and to such temperatures for the effective cleaning of all equipment and utensils. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    - Water heaters should not be placed directly on the floor. **(State Milk Board (SMB))**

- A minimum water temperature of 160ºF at the beginning of the wash cycle and an ending temperature of 120ºF is recommended. **(State Milk Board (SMB))**

- The milk house is equipped with a wash-and-rinse vat having at least two compartments. Each compartment must be of sufficient size to accommodate the largest utensil or container used. The upright wash vat for milk pipelines and milk machines may be accepted as one part of the two-compartment vat. *Provided,* that the stationary wash station rack, in or on the vat, and the milking machines inflations and appurtenances are completely removed from the vat during the washing, rinsing and/or sanitizing of other utensils and equipment. Where CIP cleaning/recirculated cleaning systems eliminate the need for hand-washing of equipment, the presence of the second wash vat compartment may be optional, if so determined by the State Regulatory Agency, on an individual farm basis. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- Hand-washing facilities are located convenient to the milk house, milking barn, stable, parlor, and flush toilet. **(Pasteurized Milk Ordinance (PMO) Item 16r)**

- Hand-washing facilities include soap or detergent, hot and cold or warm running water, individual sanitary towels and a lavatory fixture. Utensil wash and rinse vats shall not be considered as hand-washing facilities. **(Pasteurized Milk Ordinance (PMO) Item 16r)**

- The hauler shall, after disconnecting the transfer hose and with the outlet valve open, thoroughly rinse the entire inside surface of the tank with warm water. (Pasteurized Milk Ordinance (PMO) Appendix B) The farm shall supply a hose for this purpose.
    1. A separate water hose connection for the hauler to use to rinse the bulk milk tank is recommended. **(State Milk Board (SMB))**

    2. The great demand for water under pressure in milk room operations has emphasized the importance of protecting plumbing from freezing. Devices which have proved effective include: the insulation of water lines, the use of wrap-around heat tape, infrared lamps, and thermostatically controlled space heaters. **(Pasteurized Milk Ordinance (PMO) Appendix C)**

    3. Insulated milk houses make protection against freezing easier and more economical, and offer the additional advantage of greater comfort for the operator. The factor of personal convenience frequently results in better performance by the operator, with subsequent benefits to milk quality. **(Pasteurized Milk Ordinance (PMO) Appendix C)**

- The use of kerosene heaters that are manually filled and/or non-vented are not permitted in the milk house. **(Pasteurized Milk Ordinance (PMO) interpretation)**

- A transportation tank, with or without overhead protection, may be used for the cooling and/or storage of milk on the dairy farm. If a suitable shelter is provided for a transportation truck used for cooling and storing milk, such shelter shall be adjacent to but not a part of the milk house and shall comply with prerequisites of the milk house with respect to construction items: lighting, drainage, insect, and rodent control and general maintenance. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

- When the regulatory agency determines conditions exist whereby the milk tank truck can be adequately protected and sampled without contamination, a shelter need not be provided if the following minimum criteria are met **(Pasteurized Milk Ordinance (PMO) Item 5r):**

    1. The milk hose connection is accessible to, and made from within, the milk house**.** The milk hose connection to the milk tank truck is completely protected from the outside environment at all time. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    2. To assure continued protection of the milk, the milk tank truck manhole must be sealed after the truck has been cleaned and sanitized. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    3. The milk tank truck shall be washed and sanitized at the permitted milk plant receiving station or transfer station receiving the milk or at a permitted milk tank truck cleaning facility. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

    4. An accurate, accessible temperature recording device shall be installed in the milk line downstream from an effective cooling device which cools the milk to 7ºC (45ºF) or less**.** Electronic records that comply with the applicable provisions of Appendix H. IV and V, with or without hard copy, may be used in place of temperature-recording records. An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used t check the temperature-recording device during the regulatory inspection and the results recorded on the recording records or into the electronic data collection, storage and reporting system. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

5. Temperature-recording records shall be maintained on the premises for a period of a minimum of six months and are available for review by the Regulatory Agency. Except that, the electronic storage of required temperature records, with or without hard copy, shall be acceptable, provided the computer and computer generated temperature records are readily available for review by the Regulatory Agency. **(Pasteurized Milk Ordinance (PMO) Item 5r)**
6. The milk shall be sampled at the direction of the regulatory agency, in a manner so as to preclude contaminating the milk tank trucks or sample, by a permitted milk sample collector, the milk in the milk tank truck shall be effectively agitated in order to collect a representative sample. **(Pasteurized Milk Ordinance (PMO) Item 5r)**
7. The milk tank truck shall be parked on a self-draining concrete or equally impervious surface during filling and storage. **(Pasteurized Milk Ordinance (PMO) Item 5r)**

Milk Parlor
Floors

- Gutters, floors and feed troughs are constructed of good quality concrete or equally impervious material. Floors shall be easily cleaned (brushed surfaces permitted), be graded to drain, maintained in good repair and free of excessive breaks or worn areas that may create pools. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

- Gravity flow manure channels in milking barns, if used, shall be constructed in accordance with the specifications of Appendix C., II. Or acceptable to the Regulatory Agency. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

- Stall barns, when used with gutter grates over manure storage pits, are designed and constructed in accordance with the specifications of Appendix C., IV. Or acceptable to the Regulatory Agency. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

    - A grate and hopper-type or gutter drain is recommended behind cows during milking. A splash guard and manure trough should be provided behind each row of cows in parallel milking barns.

Walls and Ceilings

- Walls and ceilings are finished with wood, tile, smooth-surfaced concrete, cement plaster, brick or other equivalent materials with light colored surfaces. Walls, partitions, doors, shelves, windows, and ceilings shall be kept in good repair, and surfaces shall be refinished whenever wear or discoloration is evident.

(Pasteurized Milk Ordinance (PMO) Item 2r)

- Whenever feed is stored overhead, ceilings shall be constructed to prevent the sifting of chaff and dust into the milking barn, stable or parlor. If a hay opening is provided from a loft that is open into the milking portion of the barn, such openings shall be provided with a dust-tight door which shall be kept closed during milking operations. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

- A dust-tight partition, provided with doors that are kept closed except when in actual use, shall separate the milking portion of the barn from any feed room or silo in which feed is ground or mixed, or in which sweet feed is stored. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

- When conditions warrant, the regulatory agency may approve a barn without four walls extending from floor to roof, or a shed-type barn provided the requirement of Item 3r, prohibiting animals and fowl from entering the barn is satisfied. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

Lighting and Ventilation

- The milking barn is provided with natural and/or artificial light to insure that all surfaces and particularly the working areas will be plainly visible. The equivalent of at least 10 foot-candles (110 lux) of light in all working areas shall be provided. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

- Air circulation is sufficient minimize odors to prevent condensation upon walls and ceilings. **(Pasteurized Milk Ordinance (PMO) Item 2r)**

Water and Heat

- Hot and cold running water plumbed to the parlor for cleaning, along with adequate heat in the milk parlor to prevent the freezing of water lines is recommended. **(Pasteurized Milk Ordinance (PMO0 Appendix C)**

Pipelines and Milking Equipment

- All multi-use containers, equipment and utensils, which are exposed to milk or milk products, or from which liquids may drip, drain, or be drawn into milk or milk products, are made of smooth impervious, nonabsorbent, safe materials of the following types **(Pasteurized Milk Ordinance (PMO) Item 9r):**
    - A. Stainless steel of the ANSI (American Iron and Steel Institute)300 series; or
    - B. Equally corrosion-resistant, non toxic metal; or
    - C. Heat-resistant glass; or

- D. Plastic or rubber and rubber-like materials which are relatively inert, resistant to scratching, scoring, decomposition, crazing, chipping and distortion, under normal use conditions; are nontoxic, fat resistant, relatively nonabsorbent, relatively insoluble, do not release component chemicals or impart flavor or odor to the product; and which maintain their original properties under repeated use conditions. **(Pasteurized Milk Ordinance (PMO) Item 9r.)**

- All containers, equipment, and utensils are free of breaks and corrosion. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

- All joints in such containers, equipment and utensils are smooth and free from pits, cracks or inclusions. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

- CIP cleaned milk pipelines and return-solution lines are self-draining. If gaskets are used, they shall be self-positioning and of material meeting specifications described in d. above, and shall be of such design, finish and application as to form a smooth, flush, interior surface. If gaskets are not used, all fittings shall have self-positioning faces designed to form a smooth, flush, interior surface. All interior surfaces of welded joints in pipelines shall be smooth and free of pits, cracks, and inclusions. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

- Strainers, if used, are of perforated metal design, or so constructed as to utilize single-service strainer media. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

- All milking machines, including heads, milk claws; milk tubing and other milk contact surfaces can be easily cleaned and inspected. Pipelines, milking equipment and appurtenances which require a screwdriver or special tool shall be considered easily accessible for inspection, providing the necessary tools are available at the milk house. Milking systems shall not have components incorporated in the return solution lines, which by design do not comply with the criteria for product-contact surfaces. Some examples of these are:
    - Ball type plastic valves;
    - Plastic tees with barbed ridges to better grip the plastic or rubber hoses; and
    - The use of PVC water type piping for return solution lines. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

- Farm holdings/cooling tanks, welded sanitary piping and transportation tanks comply with the applicable requirements of Items 10p and 11p of PMO. **(Pasteurized Milk Ordinance (PMO) Item 9r)**

Manure and Barn Waste Disposal

- The cowyard, which is the enclosed or unenclosed area adjacent to the milking barn in which the lactating animals may congregate, including animal-housing areas and feed lots, is graded and drained, depressions and soggy areas are filled, and lactating animal lanes are reasonably dry. **(Pasteurized Milk Ordinance (PMO) Item 4r)**